

**POLY-PHASE NETWORK WITH RESONANT CIRCUIT BANDPASS  
SHAPING**

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8/04 10 This patent document relates to the following patent document  
filed concurrently herewith, which is incorporated herein by reference: U.S.  
Patent Application No. 10/602353, of Kwok; entitled RECTIFIER TYPE  
FREQUENCY DOUBLER WITH HARMONIC CANCELLATION.

**BACKGROUND OF THE INVENTION**

1. Field of the Invention

15 The present invention relates generally to polyphase filters, and  
more specifically to polyphase networks for generating output signals shifted  
in phase.

2. Discussion of the Related Art

20 In radio communications, polyphase networks are often used to  
ensure good image rejection in a mixer. As is understood, a polyphase  
network is a circuit that receives an input signal and produces output signals  
each having generally the same magnitude as the input signal but shifted in  
phase. For example, a typical polyphase network produces quadrature  
outputs shifted by 90 degrees. Polyphase networks conventionally include  
25 one or more R-C stages.

30 A conventional polyphase network is driven by the emitter  
follower (EF) stage of a bipolar junction transistor (BJT), which provides a low  
impedance input to the polyphase network. In other words, each input of the  
polyphase network is at the emitter of a respective transistor. Additionally,  
the input signal to the polyphase network must be extremely clean otherwise  
the polyphase network will not provide rejection of undesirable harmonics  
and spurious content. That is, the 90-degree phase difference at the center  
frequency can degrade substantially when the input signal is not a pure sine  
tone. For example, the phase offset may be calculated to be as much as 7